

Science Fair Ideas and Requirements (Grades 3 - 6)

Students may either work individually or in teams of no more than two students. Members of teams must be aware of their responsibility and commitment to each other. Both members of a team will be equally responsible for understanding the complete project and for following the instructions.

Each project must be organized to answer a question. To answer the question you must do experiments yourself not just build a model or report what you have read. You will be asking how a change in some factor affects what you see. Experiments will not be done as part of regular classroom work. You may use a sample question, modify a sample question, or choose your own question.

Each project consists of a WRITTEN REPORT, an exhibit, and an oral report.

Science fair resource teachers have been assigned to all elementary schools. He/She will be available to confer with students regarding their projects during the school day.

PROJECT IDEAS

You may choose a question in one of these topic areas, or any other you wish: insects, plants, bacteria, yeast, mold, seeds, chemistry, light, electricity, magnets, sound, heat, probability, behavior, psychology.

The following are examples of questions. You may select one of these, modify one of them, or choose your own question.

- How are seeds or plants affected by one or more of the following?
 - water, amount and color of light, soil type, fertilizer, gravity.
- What kind of surface absorbs light best?
- How do animals respond to conditions like light/dark, warm/cold, or wet/ dry? Which battery lasts longer?
- Which spot remover works better?
- How does temperature or food supply affect the action of yeast?
- How fast do plants respond to light?
- How much weight will one or more of the following hold?
 - rubber band, fishing line, paper towel, kite string, magnet
- What happens to breathing and heart rate during exercise? Does conditioning affect this? What affects the time it takes to boil water?
- What affects the time it takes for ice to melt?
- What affects the life of a photoflood bulb (voltage, on-off cycles?)
- What affects the time it takes a cake to bake or bread to rise?
- What affects the strength of an electromagnet?
- What is the best insulator for hot or cold things?
- How does the focal length of a lens affect its magnification?
- How does the amount of salt in water affect its ability to conduct a battery current? (BATTERIES ONLY!)
- If you drop a pencil on a tile floor, how often will it land on a line?
- What nails have the best holding power in types of wood?
- Which leavenings make flour rise most?

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- Which paper toweling absorbs the most water? How quickly?

INSTRUCTIONS AND PROJECT REQUIREMENTS

GENERAL REQUIREMENTS:

1. Your project must ask a question that can be answered by doing an investigation. When you do your investigation, you should keep everything the same except the one factor (manipulated variable) that you are testing. Science projects such as demonstrations and models are not appropriate for the Science Fair.
2. Individuals or partners may enter a project in the Science Fair.
3. You need to follow the SCIENTIFIC METHOD when doing your investigation. Below are the questions you need to answer when doing your investigation.
 - a. PURPOSE or QUESTION: What do you want to find out?
 - b. HYPOTHESIS: What do you think or predict will happen?
 - c. MATERIALS: What do you need to use?
 - d. PROCEDURE: What will you do to find out?
 - e. RESULTS: What happened?
 - f. CONCLUSIONS: What did you learn from your results?
4. After you have completed your investigation and taken the necessary notes, you need to share your findings with others. You will do this in three ways:
 1. WRITTEN REPORT
 2. DISPLAY/EXHIBIT
 3. ORAL PRESENTATION

These are described in detail below.

WRITTEN REPORT

1. The purpose of the written report is to use your notes to give a detailed description of your investigation so that anyone who reads it will be able to understand what you did.

*It is very important that you do this report neatly and completely since the judges will read it before they talk to you.

2. Three copies of the report are required:
One report is attached to the project, the other two copies are submitted to the judges to read. **Students MUST provide 2 extra copies of their report. Reports must be brought with the display at check-in on the Friday evening before the Science Fair.**
3. Your report should include the following parts in this order:

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PAGE 1--TITLE PAGE.

In the center of the page write the question you have asked. In the lower right corner, place your name, school, and grade.

PAGE 2--TABLE OF CONTENTS.

List the sections of your paper and the page numbers where they begin. You will have to wait until you write or type your final copy of the entire report so that you can be sure of the page numbers.

PAGE 3--QUESTION.

Restate your question along with an explanation of why you decided to test this question: HYPOTHESIS OR PREDICTION. From what you already know, predict what you think will happen.

PAGE 4--PROCEDURE. (What did you find out?)

List of materials. Be specific--what kind? How much?
Identification of variables. Tell what you kept the same and what one variable you changed.
Step-by-step direction. Drawings may be helpful to illustrate the steps.

PAGE 5--RESULTS. (What happened?)

- Use charts and tables to record your results.
- Use graphs to compare your results.
- Drawings and photographs may be appropriate.
- Be sure everything is labeled.
- Write a paragraph explaining your results.

PAGE 6--CONCLUSIONS. (What did you learn from your results?)

- You should answer your question based on the results of your investigation.
- If it is difficult to come to a conclusion from your results, state what you could have done differently in this investigation. Do not be afraid to admit where you might have done something differently. That shows great thought.
- State whether your results agree with your hypothesis or prediction.
- State additional experiments you could do to learn more.

PAGE 7--RESOURCES

- List 2 or 3 websites, books, or magazine articles that you read to give you background information.

Examples of correct style:

Jones, Sandra. "How Bees Behave." Science for Children, October, 1988. (magazine)

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Smith, John. All About Plants. (book)
Lastname, F. M. (Year, Month Date). *Title of page*. Site name.
URL (website)

PAGE 8--ACKNOWLEDGMENTS

- Make a list of people you would like to thank for helping you in any way. Give their name, who they are, and how they helped you.

DISPLAY OR EXHIBIT

- The purpose of the display is to give viewers a brief visual summarization of your investigation.
- Your space will be 40" wide and 30" deep.
- No electricity will be available.
- Your display should be constructed of a 2 or 3-panel display that will stand and support itself.
- Lettering needs to be neat so that it can be easily read.
- By writing on other sheets of paper and then gluing them on the display board, you may save yourself some frustration.
- Suggestion for a 3-sided display board is shown below.

HYPOTHESIS (prediction)	QUESTION (Title) photos and/or drawings	RESULTS graphs and charts, photos and/or drawings
PROCEDURE with photos and/or drawings	Equipment and samples can go on the board or table in front of the board	CONCLUSION graphs and charts

ORAL REPORT and QUESTIONING

- The purpose of the oral report is to explain in your own words what you did and then to answer the judges' questions.
- You will stand in front of your display and summarize your investigation. Do not read your report. You should about take 2 minutes to do this.
- You may want to use the display board to remind you of what to say. Be sure you include your question, prediction, procedure, results, and conclusion.
- Be ready to answer any questions the judges ask you. Remember by asking questions they are not criticizing you but trying to better understand what you did. They may also offer suggestions for things you could improve or do differently next time.

PARENT RESPONSIBILITIES

Although one of the evaluation criteria is independent work, parents are encouraged to discuss the project with the student and provide assistance with research of preparation of the exhibit.

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Students themselves should do the manipulations and measurements in the experiments and should make their own drawings and charts.

- Help your child meet the requirements as outlined above.
- If your child has a question that they need clarified, have them talk to the resource teacher at their school. Another possibility is calling this designated teacher after school.
- Help your child by setting up a time schedule to allow plenty of time to do the project.
- Try not to get possessive about the project. Let it end up looking exactly what it is: the ideas and work of your child. If you type the report, do not embellish it with your own ideas and words.
- Instill in your child the idea that they are indeed a scientist, learning something about this world. No one else has done this experiment the same way they are doing it. That makes it very special.
- Emphasize the joy of learning and experimenting.

2. JUDGING

A team of two judges will objectively evaluate the Science Fair entries using the following [Science Fair Evaluation Form](#). Feedback will be provided on which elements are observed or not-observed.

STUDENTS SCIENCE FAIR CHECKLIST

WEEKLY CHECK LIST OF WHAT YOU SHOULD BE DOING

- 1 Make your decision about entering.
Decide whether or not you will complete the project independently or with a partner.
Register for the Science Fair using this form.

- 2 Read through the Science Fair instructions.
Go to the library and/or visit online resources to give you ideas for a topic.
Make sure your topic asks a question that can be answered by doing an experiment.

- 3 Select your topic and question.
Meet with your school's Science Fair Resource Teacher if you need assistance
He/she can tell you whether or not the question you have picked out is appropriate.
Go to the library or visit online sources to learn about your subject.

- 4 Make up your hypothesis (prediction of what will happen.)
Find the materials needed to do your investigation.
Plan your investigation.
Write down your directions, step-by-step.

- 5 Conduct your experiment and collect data. Keep careful records. Some short investigations need to be repeated 3 times so that you have 3 trials.
Use the average when reporting results.

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- 6 Organize the results of your experiments in chart and graph form. If you put your information (data) in a chart or table and then make graphs to compare data, your results are easily understood.
Draw your conclusion by looking at your results.
When your resource teacher meets with you, give him/her an update on what you have done.
- 7 Write your written report using the detailed instructions on the requirement sheet. It is important that the report is done neatly.
Follow the instructions carefully.
- 8 Construct your exhibit. Mount your information to the display board so that it is informative and appealing to the eye.
- 9 Prepare your 2 minute oral presentation. (Check for content)
Go over the background information you read so that it is fresh in your mind.
Bring your display and 3 copies of your written report to O'Neill Middle School on **Friday night at check-in.**